

What is claimed is:

1. A method of improving the braking and clutch capacity of a functional fluid,  
said method comprising adding a friction-modifying amount of a  
polyalkenyl sulfonate to said functional fluid, said polyalkenyl sulfonate  
5 having a TBN of about 0 to about 60 wherein said polyalkenyl sulfonate is  
an alkali metal or alkaline earth metal salt of a polyalkylene sulfonic acid  
derived from a mixture of polyalkylenes comprising greater than about 20  
mole percent alkyl vinylidene and 1,1-dialkyl isomers.
- 10 2. The method according to Claim 1, wherein the polyalkenyl sulfonate has a  
TBN of about 0 to about 30.
3. The method according to Claim 1, wherein the mixture of polyalkenes  
comprises greater than about 50 mole percent alkyl vinylidene and 1,1-  
dialkyl isomers.
- 15 4. The method according to Claim 1, wherein the mixture of polyalkenes  
comprises greater than about 70 mole percent alkyl vinylidene and 1,1-  
dialkyl isomers.
- 20 5. The method according to Claim 1, 2, 3, or 4 wherein the alkyl vinylidene  
isomer is a methyl vinylidene isomer, and the 1,1-dialkyl isomer is a 1,1-  
dimethyl isomer.
6. The method according to Claim 1, wherein the number average molecular  
weight of the polyalkene is about 168 to about 5,000.
- 25 7. The method according to Claim 1, wherein the number average molecular  
weight of the polyalkene is about 350 to about 2,300.

8. The method according to Claim 1, wherein the number average molecular weight of the polyalkene is about 350 to about 1,000.
9. The method according to Claim 1, wherein the number average molecular weight of the polyalkene is about 350 to about 750.
- 5 10. The method according to Claim 1, wherein the polyalkene is polyisobutene.
11. The method according to Claim 10, wherein the polyisobutene is made using a  $\text{BF}_3$  catalyst.
- 10 12. The method according to Claim 1, wherein the polyalkene is polyisobutene and the molecular weight distribution of the polyisobutenyl sulfonic acids has at least about 80% of the polyisobutenyl sulfonic acids molecular weights separated by even multiples of about 56 daltons.
- 15 13. The method according to Claim 1, wherein the polyalkene is polyisobutene and less than about 20% of the polyisobutenyl sulfonic acids in the molecular weight distribution of the polyisobutenyl sulfonic acids contain a total number of carbon atoms that is not evenly divisible by about four.
14. The method according to Claim 1, wherein the functional fluid is an automatic transmission fluid or hydraulic fluid.
- 20 15. The method according to Claim 14, wherein the functional fluid is a hydraulic fluid.
16. The method according to Claim 15, wherein the hydraulic fluid is a tractor hydraulic fluid.

17. A method of improving the braking and clutch capacity of a functional fluid,  
said method comprising adding a friction-modifying amount of a  
polyalkenyl sulfonate to said functional fluid, said polyalkenyl sulfonate  
having a TBN of greater than about 60 to about 400 wherein said  
5 polyalkenyl sulfonate is an alkali metal or alkaline earth metal salt of a  
polyalkylene sulfonic acid derived from a mixture of polyalkylenes  
comprising greater than about 20 mole percent alkyl vinylidene and 1,1-  
dialkyl isomers.
18. The method according to Claim 1, wherein the polyalkenyl sulfonate has a  
10 TBN of about 250 to about 350.
19. The method according to Claim 18, wherein the mixture of polyalkenes  
comprises greater than about 50 mole percent alkyl vinylidene and 1,1-  
dialkyl isomers.
- 15 20. The method according to Claim 16, wherein the mixture of polyalkenes  
comprises greater than about 70 mole percent alkyl vinylidene and 1,1-  
dialkyl isomers.
21. The method according to Claim 16, 17, 18, or 19 wherein the alkyl  
vinylidene isomer is a methyl vinylidene isomer, and the 1,1-dialkyl isomer  
20 is a 1,1-dimethyl isomer.
22. The method according to Claim 16, wherein the number average  
molecular weight of the polyalkene is about 168 to about 5,000.
23. The method according to Claim 16, wherein the number average  
molecular weight of the polyalkene is about 350 to about 2,300.

25

24. The method according to Claim 16, wherein the number average molecular weight of the polyalkene is about 350 to about 1,000.
25. The method according to Claim 16, wherein the number average molecular weight of the polyalkene is about 350 to about 750.
- 5 26. The method according to Claim 16, wherein the polyalkene is polyisobutene.
- 10 27. The method according to Claim 26, wherein the polyisobutene is made using a  $\text{BF}_3$  catalyst.
28. The method according to Claim 16, wherein the polyalkene is polyisobutene and the molecular weight distribution of the polyisobutenyl sulfonic acids has at least about 80% of the polyisobutenyl sulfonic acids molecular weights separated by even multiples of about 56 daltons.
- 15 29. The method according to Claim 16, wherein the polyalkene is polyisobutene and less than about 20% of the polyisobutenyl sulfonic acids in the molecular weight distribution of the polyisobutenyl sulfonic acids contain a total number of carbon atoms that is not evenly divisible by about four.
- 20 30. The method according to Claim 16, wherein the functional fluid is a tractor hydraulic fluid or an automatic transmission fluid.
31. The method according to Claim 30, wherein the functional fluid is a tractor hydraulic fluid.